

# Psychometric Evaluation of the Family-Centered Care Scale for Pediatric Acute Care Nursing

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- ▶ **Background:** Caring for families is fundamental to pediatric nursing. However, existing measures do not capture parents' experiences with family-centered nursing care.
- ▶ **Objective:** The aim of this study was to describe the development and initial psychometric testing of the Family-Centered Care Scale, a seven-item instrument designed to measure a parent's experience of nursing care that embodies core principles of family-centered care.
- ▶ **Methods:** In Phase 1, 18 items describing what nurses do to engage parents of hospitalized children were derived from the literature describing mutuality. After establishing face validity, pretesting, and revision for clarity, the scale was administered to a convenience sample of 91 parents of hospitalized patients. In Phase 2, two items on parents' perceptions of being well-cared-for were added. The 20-item scale was administered to 564 parents of children recruited from all inpatient units in a children's hospital. In Phase 3, the scale was shortened to seven items and retested for validity among 454 additional parents.
- ▶ **Results:** Internal consistency reliability was high across all versions and testing phases. Confirmatory factor analysis with data from a subsequent sample supported the final factor structure, regardless of patient type and race. There was a linear association between the scale consistency scores and overall quality of care ratings, supporting predictive validity of the scale.
- ▶ **Discussion:** The Family-Centered Care Scale showed initial evidence of reliability and validity among parents with hospitalized children.
- ▶ **Key Words:** family · family-centered care · hospitalization · instrument development

Caring for families is fundamental to the practice of pediatric nursing (Ahmann & Johnson, 2001; Lewandowski & Tesler, 2003; Shelton, Stepanek, & the Association for the Care of Children's Health, 1994). When congruent with core principles of family-centered care, pediatric nurse–parent relationships exemplify mutual respect, reciprocal sharing of knowledge and expertise, and shared participation. Positive nurse–parent relationships can impact parents, their hospitalized child, and pediatric nurses (Curley, 1997). However, existing measures do not capture parents' experiences with family-centered care, including experiences within the nurse–parent relationship.

Family-centered care is defined as a collaborative relationship between families and professionals in the pursuit of being responsive to the priorities and needs of families wherever they seek healthcare (American Academy of Pediatrics Committee on Hospital Care, 2003; Coker, Rodriguez, & Flores, 2010; Dunn, Reilly, Johnston, Hoopes, & Abraham, 2006; O'Malley, Brown, & Krug, 2008). Nurse–parent relationships that embody the philosophy of family-centered care acknowledge and support the evolution of parents toward greater competency in their role as their child's primary caregiver (Curley, 1988, 1997; Curley & Wallace, 1992).

Despite the near-universal adoption of family-centered care in pediatric hospitals, there is evidence to suggest that the incorporation of these core values into the practice of nursing may be lagging. Several studies report that parents desire more involvement in their child's care and often feel as though they are expected to relinquish their parenting role to health professionals when their child is hospitalized (Graham, Pemstein, & Curley, 2009). Comparatively, studies of nurses and other health professionals describe the reluctance of healthcare professionals to give up control over a child's care as well as the difficulties clinicians encounter when attempting to incorporate principles of family-centered care into their daily practice (Dingeman, Mitchell, Meyer, & Curley, 2007).

This disconnection between what individuals value and practice, along with an increasing recognition of the benefits of nurse–parent collaboration, prompted the development of the brief Family-Centered Care Scale (FCCS), a seven-item scale used to measure the degree of nurse–parent mutuality experienced by parents. The FCCS is the first scale developed to measure this specific aspect of the nurse–parent relationship and provides an opportunity to assess parents' experiences with family-centered nursing care. The purpose of

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this study is to describe the development and initial psychometric testing of the FCCS.

### Family-Centered Care and Pediatric Nurse-Parent Relationships

Family-centered care is an approach to care that is grounded in beneficial partnerships between families and healthcare professionals to recognize the importance of the family in the patient's life (American Academy of Pediatrics Committee on Hospital Care, 2003; American Academy of Pediatrics Committee on Hospital Care and Institute for Patient- and Family-Centered Care, 2012). Pediatric nursing is practiced within multiple relationships. One crucial element of therapeutic nurse-parent relationships is the attribute of mutuality. Mutuality not only embodies the philosophy of family-centered care; it acknowledges and supports the evolution of parents and nurses toward greater competency in their respective roles.

Curley (1997) defined mutuality as a synchronous, co-constituting relationship that stimulates the process of personal becoming. Pediatric nurses seek synergistic, respectful relationships with parents that are responsive to parents' individual needs. Pediatric nurses assume a welcoming stance with parents; they work to understand the parent's perspective while building shared meanings of evolving events. They create opportunities for parents to assume a level of engagement that they choose and provide parents with the knowledge, skills, and support they need to be successful. Pediatric nurses help parents better understand and manage their child's healthcare situation. Through reciprocal therapeutic relationships, parents and nurses develop greater self-awareness and self-understanding, which contributes to their personal growth as parents of acutely ill children and as expert pediatric nurses, respectively.

## Methods

The instrument was developed and evaluated in three phases. An initial 18-item FCCS was developed and pilot-tested in Phase 1. It was then refined and tested in Phase 2, resulting in a shortened seven-item version focused on the care qualities rated by parents as most important. This brief version was then further tested for validity in Phase 3. All three phases of data collection were reviewed and approved by human subjects committees of the organizations where the data were collected, specifically, the McMaster Children's Hospital in Ontario and Boston Children's Hospital in Massachusetts.

### Phase 1: Scale Development

The scale was developed to examine nursing interventions that reflected mutuality within the nurse-parent relationship (Hunsberger, 2000). Eighteen items describing what nurses do to engage parents of hospitalized children were derived from the literature describing mutuality (Curley, 1988, 1997; Curley & Wallace, 1992). The items were focused on the actions of nurses, and parents were asked to indicate (a) the importance of each item and (b) the consistency with which nurses behaved in that way throughout their child's hospital stay. Assessing both importance and consistency aligned with the core attributes of mutuality, specifically, that nurses consistently provide the type of care identified as important to parents. Five-point Likert-type response scales were used for these items, ranging from *not at all important/consistent* (1)

to *very important/consistent* (5). Each item was prefaced by the word "nurses" followed by an action term (e.g., "nurses help," "nurses explain," or "nurses treat"). Separate sum scores were computed for importance and consistency and had a possible range of 18–90, with higher scores indicating greater importance or consistency. Face validity was established by a team of five expert pediatric nurses and four parents from inpatient units at McMaster Children's Hospital.

The items were then pretested with a group of 21 parents from inpatient units at McMaster Children's Hospital, revised based on feedback, and reviewed by a content expert with expertise in the concept of mutuality. This revised tool was administered to a larger convenience sample of 91 English-speaking parents of hospitalized children admitted to a 24-bed medical unit in a children's hospital in Southern Ontario, Canada. Parents of children aged 3 months to 12 years admitted for various conditions were approached to complete the scale at hospital discharge.

### Phase 2: Scale Refinement

The second phase of scale development and evaluation was undertaken in two parts at Boston Children's Hospital. The FCCS was used on all inpatient units as a quality improvement tool to describe the extent to which parents experienced family-centered nursing care. Two items were added as global measures of family-centered nursing care: (a) "Nurses help my child feel well-cared-for" and (b) "Nurses help me feel well-cared-for," resulting in 20 total items for psychometric testing. These items were added after the American Academy of Nursing identified a patient's perception of being well-cared-for as a nurse-sensitive quality outcome indicator that was relevant across the continuum of care (Mitchell, Heinrich, Moritz, & Hinshaw, 1997).

In the first part of Phase 2 (Phase 2A), this 20-item scale was administered semiannually during 2002 and 2003 to a random selection of 420 parents of hospitalized children. After analyzing item and scale properties in these data, the instrument was shortened to the current seven items (Figure 1) and administered to another sample of 144 parents in 2004 (Phase 2B).

The same recruitment and data collection procedures were used throughout Phase 2. Parents who were unable to speak English or those who were identified by the charge nurse to be engaged in end-of-life decisions about their child were excluded. Also excluded were parents of adolescents who were older than 18 years old. All inpatient units were included and sampled in random order. During the 7- to 9-day data collection periods, parents on each nursing unit were selected randomly by the last digit of their child's medical record number. All parents of children with the randomly selected digit were sequentially recruited until 50% of all parents or a minimum of 10 parents participated per unit. A random number generator was used to create the randomization sequence. Data were collected by two trained nonnurse research assistants.

Parents were approached after consultation with a member of the clinical team. They were invited to complete the survey when they were emotionally available to attend to the request and when the clinical environment was quiet. The research assistants introduced themselves, noting that they were not nurses involved in their child's care. They then presented the purpose of the survey, noting that parent participation was voluntary and that all information would be reported in

Statements about nurses
1. Nurses help me feel welcomed.....
2. Nurses help me feel important in my child's care.....
3. Nurses treat me as a valued team member when planning my child's nursing care.....
4. Nurses give explanations about the nursing care they provide.
5. Nurses explain about changes I could expect in my child's condition.....
6. Nurses help my child to feel well-cared-for.....
7. Nurses help me to feel well-cared-for.....

**FIGURE 1.** Family-Centered Care Scale. Note: Complete instrument is available from the corresponding author.

aggregate. Parents agreeing to participate were given the option to complete the survey with assistance from the research assistant or to complete the survey independently before discharge. Parents were instructed to seal their completed survey in an envelope that was retrieved by the research assistant.

The FCCS scoring was redesigned in Phase 2 to link importance and consistency in a single score based on the degree of match between parents' importance and consistency ratings of each aspect of nursing care. A match between parent expectations and nursing care occurred if the consistency rating for an item was the same as the importance rating for that item (e.g., scored 1 on importance and 1 on consistency) or was +1 of the importance score (e.g., scored 1 on importance and 2 on consistency). There was no match if any other combination of scores was present; for example, when the consistency rating was more than +1 of the importance rating (e.g., 1 for importance and 3 for consistency) or if the consistency score was lower than the importance score (e.g., 2 for importance and 1 for consistency). The number of matches was then summed and divided by the total number of possible matches, then multiplied by 100, to compute a percent match score.

Survey responses were entered into a computer database that was stored on a secure hospital server and accessed only by study staff. Respondents were assigned unique study numeric identifiers, and no identifying information was included in the data set. Psychometric evaluation during Phase 2 was focused on assessing item characteristics (response means and variance), internal consistency reliability (Cronbach's alpha and corrected item-total correlations), and dimensionality (exploratory factor analysis) in a larger, more diverse population. Exploratory factor analysis was conducted separately for the importance and consistency scales using principal components analysis with oblique rotation and examination of the scree plot to identify the primary factors. Item factor loadings <0.50 indicated poor fit on that factor. All analyses were conducted using SPSS v. 18.0.

### Phase 3: Validity Testing

In 2008–2009, the FCCS was administered, along with the Pediatric Inpatient Experience Survey (PIES), to a new sample of 454 parents at Boston Children's Hospital. The

PIES is used to assess parents' perceptions of care received during their child's most recent hospitalization and includes items addressing nursing care, physician care, parent involvement in care, patient comfort, admissions process, discharge and home care preparation, medication, and hospital environment (Ziniel et al., 2011). Families were selected from daily census reports for all inpatient units using a stratified sampling method to obtain equal numbers of medical and surgical patients. Study staff recruited each type of family on alternating days, rotating their time across the different inpatient units. Families unable to read English fluently were excluded, as were those who had other recent stays to avoid duplicate recruitment. Study staff approached eligible families before the discharge process had begun, identified the parent or primary guardian, described the study using a standard script, and invited them to participate.

Participating parents and guardians received the FCCS to complete while in the hospital and then sealed the completed form in an envelope to hand back to the interviewer. Participants were then assigned randomly to receive the PIES by mail or by telephone within 2 weeks of returning home. Parents received a \$10 gift card and a hospital parking voucher for completing the FCCS and a \$20 gift card after completing the PIES. The two surveys were linked through a unique randomly generated numeric code assigned to each family, with no identifying information included in the data set. The FCCS and paper PIES surveys were scanned for data entry into a computerized database. Phone survey responses were entered directly into the database during the interview.

Construct validity of the FCCS was assessed by (a) examining the correlation between FCCS scores with PIES subscale scores measuring similar or different constructs (convergent or discriminant validity), (b) comparing FCCS scores across groups expected to differ (i.e., based on parents' ratings of the overall quality of the care they received; known-groups validity), and (c) conducting confirmatory factor analysis to assess fit with the expected factor structure. For correlations, Spearman's rho coefficients were calculated because of the skewed distribution of FCCS scores. One-way ANOVA and Wilcoxon rank-sum test were used to compare FCCS consistency scores across ratings of care quality (1 = *poor* to 6 = *exceptional*). Mplus v. 5.21 (Muthén & Muthén, 2012) was used to conduct confirmatory factor analyses to evaluate fit of the new data to the factor structure models identified in Phase 2. All variables were specified to be ordinal (categorical), and a mean- and variance-adjusted weighted least squares estimator (in Mplus) was used (Muthén, 1984; Muthén, du Toit, & Spisic, 1997). Model fit was tested using the following robust fit measures (appropriate for analysis of variables with non-normal distributions; Yu, 2002) and their respective thresholds for adequate fit: chi-square exact-fit test (nonsignificance indicates fit), comparative fit index (CFI) and Tucker-Lewis Index (TLI; > 0.95 threshold for both), root mean square error of approximation (RMSEA; <0.06 threshold), and the weighted root-mean-square residual (WRMR; <1.0 threshold).

### Results

Phase 1 participants ( $n = 91$ ) were largely White non-Hispanic mothers of children (median age = 2.5 years, interquartile range [IQR] = 10 months to 5 years) admitted to McMaster

Children's Hospital through the emergency department (62%; Table 1). Their overall mean scores on the initial 18-item importance and consistency subscales were 83.1 ( $SD =$

8.2) and 67.7 ( $SD = 15.2$ ), respectively. Internal consistency reliability was high for both importance ( $\alpha = 0.88$ ) and consistency ( $\alpha = 0.93$ ).

TABLE 1. Sample Characteristics

	Phase 1	Phase 2		Phase 3
	<i>n</i> (%)	A, <i>n</i> (%)	B, <i>n</i> (%)	<i>n</i> (%)
Total <i>n</i>	91	420	144	454
Parent characteristics				
Age (mean $\pm$ <i>SD</i> ) in years	—	35.6 $\pm$ 7.9	35.9 $\pm$ 8.1	—
Gender				
Female	79 (86.8)	334 (80.9)	104 (74.3)	315 (70.2)
Male	12 (13.2)	79 (19.1)	36 (25.7)	134 (29.8)
Race and ethnicity				
White, non-Hispanic	—	324 (81.2)	97 (69.3)	—
Black, non-Hispanic	—	21 (5.3)	15 (10.7)	—
Hispanic	—	33 (8.3)	16 (11.4)	—
Asian or Pacific Islander	—	15 (3.8)	4 (2.9)	—
Other	—	6 (1.5)	8 (5.7)	—
Highest education level				
<College degree	40 (44.0)	—	—	154 <sup>a</sup> (40.5)
College degree or more	51 (56.0)	—	—	226 <sup>a</sup> (59.5)
Prior inpatient stays at this hospital for any child				
None	—	178 (45.1)	50 (37.6)	210 (46.8)
1–2 times	—	81 (20.5)	31 (23.3)	74 (16.5)
$\geq 3$ times	—	136 (34.4)	52 (39.1)	165 (36.7)
Child characteristics				
Age				
<1 year	20 (22.0)	136 (32.9)	47 (33.6)	60 (15.0)
1–4 years	40 (44.0)	91 (22.0)	33 (23.6)	98 (24.6)
5–12 years	31 (34.1)	102 (24.6)	38 (27.1)	135 (33.8)
13+ years	0 (0.0)	85 (20.5)	22 (15.7)	106 (26.6)
Race and ethnicity				
White, non-Hispanic	—	—	—	342 (76.5)
Black, non-Hispanic	—	—	—	33 (7.4)
Hispanic	—	—	—	34 (7.6)
Asian or Pacific Islander	—	—	—	23 (5.1)
Other	—	—	—	15 (3.4)
Prior inpatient stays at this hospital for this child				
None	35 (38.5)	—	—	210 <sup>a</sup> (46.8)
1–2 times	35 (38.5)	—	—	74 <sup>a</sup> (16.5)
$\geq 3$ times	9 (9.9)	—	—	165 <sup>a</sup> (36.7)
Type of inpatient unit				
Medical	55 (60.4)	169 (40.2)	57 (39.6)	230 (49.3)
Surgical	13 (14.3)	88 (21.0)	31 (21.5)	224 (50.7)
Cardiovascular and critical care	13 (14.3)	130 (31.0)	46 (31.9)	—
Neurology or neurosurgery	10 (10.9)	33 (7.9)	10 (6.9)	—

<sup>a</sup>From subsample of 380 that completed the full inpatient experience survey.

After adding the two global items (child feels well-cared-for and parent feels well-cared-for), the 20-item FCCS was administered to a larger randomly selected sample of 420 parents (Phase 2A) who were primarily White non-Hispanic mothers with a child (median age = 3.4 years, IQR = 7 months to 10 years) receiving care in an inpatient unit at Boston Children's Hospital and who had experienced one or more hospitalizations (Table 1). As with the pilot sample, internal consistency reliability was high in this larger sample, with a Cronbach's alpha of .92 for the importance subscale and .96 for the consistency subscale (Table 2). Consistency ratings were generally lower than importance ratings, and the percent of parents with importance-consistency matches ranged from 60% to 77% across items.

There were no significant differences (i.e., meeting a  $p < .017$  criteria for significance after a Bonferroni correction for multiple comparisons) in importance and consistency ratings or the percent match by hospital length of stay, past inpatient experience, or parent age (data not shown). However, mothers and female guardians gave significantly higher importance ratings than fathers and male guardians (data not shown) on four items relating to being asked for input (items 5, 13, and 14 on Table 2) and having their suggestions for their child's care utilized (item 16 on Table 2). These higher item ratings contributed to an overall higher total importance score for mothers compared with fathers (median [IQR] = 86 [80–90] vs. 83 [75–88], Mann-Whitney  $U$   $z$  score = 2.49,  $p = .013$ ). There were no such parent gender differences in consistency ratings and in the percent importance-consistency match. Understandably, total importance scale scores, but not consistency scores nor percent match, varied by child's age, with scores being significantly higher for infants (<1 year old) than for patients aged 13 years or older (median [IQR] = 87 [81.5–90] vs. 82.8 [73–88], Mann-Whitney  $U$   $z$  score = -2.73,  $p = .006$ ). Importance scale scores for patients aged 1–4 and 5–12 years fell in the middle (median [IQR] = 85 [80–88.5] vs. 86.2 [79–89]) and did not differ from the other two groups.

The high alphas, as well as inter-item correlations of .60 or higher, indicated some redundancy across items and an opportunity to shorten the tool. Because of the focus on family-centered care, items that parents rated as most important to them (i.e., >75% of parents rated the item as *very important*) were retained: (a) "Nurses...help my child feel well-cared-for," (b) "Nurses explain about changes I could expect in my child's condition," (c) "Nurses help me feel important in my child's care," (d) "Nurses give explanations about the nursing care they provide," (e) "Nurses help me feel welcomed," (f) "Nurses treat me as a valued team member when planning my child's nursing care," and (g) "Nurses ask me to tell them things about my child that they should know." Although not rated as highly in importance by parents, the global item "Nurses help me to feel well-cared-for" was retained as an overall parent-care measure. The Cronbach's alphas for the shortened scales were .70 for importance and .90 for consistency. One importance item, "Nurses ask me to tell them things about my child..." had a low corrected item-total correlation (.19) and was dropped, resulting in a seven-item measure (score range = 7–35 for each subscale) that was tested in the next sample of parents (Phase 2B).

Phase 2B participants ( $n = 144$ ) were sampled, as described, from Boston Children's Hospital. Although more

racially diverse, they were otherwise demographically similar to Phase 2A parents (Table 1). The total participation rate across the two samples was 95%. Of the 26 nonparticipants, nine parents agreed but never completed the survey, eight parents stated that they did not have the time nor interest in completing the survey, five parents were discharged before completing the survey, and four parents stated that they did not have enough experience to evaluate nursing care.

Parent ratings of the importance items were similarly high across the two samples, supporting the relevance of these care qualities to parents (Table 2). Interestingly, the differences found in importance scale scores by parent gender and child age in the Phase 2A sample were not found with the shortened scale in Phase 2B. Such differences may have been ameliorated by retaining only those items that were given the highest importance ratings by parents universally. Internal consistency reliability was again high, with a Cronbach's alpha of .82 for the importance subscale and .93 for consistency. Importance-consistency match percentages ranged from 62% to 76%, also similar to the previous sample, and occurred least often for "Nurses explain about changes I could expect in my child's condition" and most often for "Nurses help my child feel well-cared-for."

Exploratory factor analysis of the importance items using all Phase 2 data combined ( $n = 564$ ) showed estimated communalities of .40–.75 across the seven items and suggested the presence of two factors, one relating to the child's care and the other relating to how nurses care for parents. These two components had eigenvalues of 3.4 and 0.9, respectively, and accounted for 61% of the variance. After oblique rotation, the first factor contained four items ("Nurses explain about the nursing care they provide," "Nurses explain about changes I could expect in my child's condition," "Nurses treat me as a valued team member when planning my child's nursing care," and "Nurses help my child to feel 'well-cared-for'") with factor loadings ranging from .67 to .85. The "valued team member" item had a moderate cross-loading on the second factor (0.54). The second factor contained the remaining three items (factor loadings of .56–.86) of "Nurses help me feel welcomed," "Nurses help me feel important in my child's care," and "Nurses help me feel 'well-cared-for.'" However, the latter item (how well parents felt cared for) loaded nearly equally on both factors (0.53 on factor 1, 0.56 on factor 2). Correlation between the two importance factors was moderately high ( $r = .51$ ). There appeared to be greater cohesiveness across the consistency items, with high estimated communalities (range = .63–.69), and a single factor emerging that explained 66% of the variance and had an eigenvalue of 4.6 (next largest eigenvalue = 0.5). Item factor loadings ranged from .79 to .83.

To assess validity, the seven-item FCCS was administered 4 years later to a new sample of 454 parents at Boston Children's Hospital (Phase 3). Block-stratified recruitment of participants in Phase 3 resulted in equal proportions of patients from medical or surgical units and of patients with no prior stay or one or more prior stays (Table 1). Phase 3 participants tended to have older children than in prior samples, and there were more male respondents. Cronbach's alphas and importance ratings were remarkably similar to those found in prior samples (Table 3). In this phase, participants completed both the FCCS while in the hospital and the more comprehensive

**TABLE 2. Phase 2 Item Response Statistics (% Important, % Consistent, % Match Between Importance and Consistency) and Internal Consistency Reliability (Corrected Item-Total Correlations and Cronbach's Alphas)**

Nurses ...	Phase 2									
	A (n = 420)					B (n = 144)				
	% Very important/ % important	CITC	% Very consistent/ % consistent	CITC Match <sup>a</sup>	% Very important/ % important	% Very consistent/ % consistent	CITC	% Very important/ % important	% Very consistent/ % consistent	CITC Match <sup>a</sup>
1. Help me feel welcomed	77.9/95.1	.48	62.5/88.0	.65	73.3	78.5/97.2	.45	60.8/89.5	.72	73.4
2. Help me feel important in my child's care	81.5/95.5	.55	61.6/88.8	.75	72.8	81.1/93.7	.63	60.8/86.0	.80	71.3
3. Ask me to tell them things about my child that they should know <sup>b</sup>	76.6/92.4	.32	48.7/81.5	.63	67.0	—	—	—	—	—
4. Explain the purpose of the equipment in my child's room	62.2/87.8	.49	49.1/77.4	.65	71.7	—	—	—	—	—
5. Ask me how I want to participate in my child's care	67.9/87.8	.70	45.1/67.7	.77	61.9	—	—	—	—	—
6. Help me figure out how I can be most helpful to my child	70.9/90.4	.71	45.8/74.6	.83	63.0	—	—	—	—	—
7. Help me to feel self-confident in caring for my sick child	71.1/89.0	.70	51.4/79.8	.80	68.0	—	—	—	—	—
8. Tell me that working together results in the best care for my child	61.8/81.2	.66	44.1/69.6	.82	67.6	—	—	—	—	—
9. Treat me as a valued team member when planning my child's nursing care	76.7/93.5	.75	54.9/83.3	.82	70.6	79.7/95.1	.74	60.8/85.3	.76	73.4
10. Give explanations about the nursing care they provide	81.1/94.2	.65	65.7/86.5	.71	77.2	87.3/97.2	.61	63.4/85.9	.74	72.5
11. Explain about changes I could expect in my child's condition	82.1/96.2	.64	53.3/82.5	.75	66.9	87.9/97.2	.69	54.6/74.5	.86	61.7
12. Explain how to respond to my child's behavior and emotional reactions related to illness and hospitalization	68.4/87.4	.70	42.2/66.9	.78	59.8	—	—	—	—	—
13. Ask me for my ideas on how to interpret and respond to my child's behavior and emotional reactions related to illness and hospitalization	66.8/85.7	.70	41.8/69.5	.73	63.1	—	—	—	—	—
14. Ask me how I think my child is doing	73.1/89.0	.65	54.0/78.9	.71	69.7	—	—	—	—	—
15. Tell me they value my opinion <sup>b</sup>	58.6/78.4	.65	40.2/66.7	.79	66.7	—	—	—	—	—
16. Use my suggestions about how to care for my child	69.8/86.2	.67	50.2/76.3	.72	73.0	—	—	—	—	—
17. Help me to feel comfortable about taking a break from my child's room	68.0/85.1	.61	54.9/79.6	.67	70.8	—	—	—	—	—
18. Encourage me to express any anxious feelings or concerns I might have	65.9/85.6	.73	49.0/72.1	.77	69.5	—	—	—	—	—
19. Help me to feel well-cared-for	63.5/83.5	.61	68.2/88.4	.72	77.1	62.0/78.2	.47	54.9/76.1	.79	76.1
20. Help my child to feel well-cared-for	91.1/98.1	.51	61.4/85.9	.71	68.1	95.1/99.3	.58	72.2/94.4	.80	76.4
Cronbach's alpha for scale	.92/.93 <sup>c</sup>	—	96/.96 <sup>c</sup>	—	—	.82	—	—	.93	—
Scale score (median, IQR) <sup>d</sup>	86 (79–89)	—	79 (68–88)	—	—	35 (32–35)	—	33 (28–35)	—	—

Abbreviation: CITC = corrected item-total correlations.  
<sup>a</sup>Percent where consistency score exactly matched importance score or was +1 of importance score.  
<sup>b</sup>Included only in first two of the four administrations in Phase 2 (n = 275).  
<sup>c</sup>First alpha is for the full 20 original items (n = 275); second alpha is for the 18 items retained after dropping items 3 and 15.  
<sup>d</sup>Scale score possible range of 20–100 in Phase 2A and 7–35 in Phase 2B.

**TABLE 3. Phase 3 Item Response Statistics (% Important, % Consistent, % Match Between Importance and Consistency) and Internal Consistency Reliability (Corrected Item-Total Correlations and Cronbach's Alphas)**

Nurses...	Phase 3 (n = 454)				
	% Very important/ % important	CITC	% Very consistent/ % consistent	CITC	% Match <sup>a</sup>
1. Help me feel welcomed	81.1/98.0	.59	71.8/94.8	.74	81.9
2. Help me feel important in my child's care	80.2/97.6	.62	68.8/93.2	.79	82.6
3. Treat me as a valued team member when planning my child's nursing care	80.6/97.8	.67	68.1/90.2	.79	79.3
4. Give explanations about the nursing care they provide	84.1/98.8	.54	59.0/86.7	.78	76.2
5. Explain about changes I could expect in my child's condition	84.7/97.4	.49	66.7/90.7	.74	68.4
6. Help me to feel well-cared-for	62.0/86.3	.43	62.8/89.5	.75	84.6
7. Help my child to feel well-cared-for	91.2/99.0	.48	76.0/95.7	.73	81.7
Cronbach's alpha for scale	.78	—	.92	—	—
Scale score (median, IQR)	34 (29–35)		34 (31–35)		

Abbreviation: CITC = corrected item-total correlations.

<sup>a</sup>Percent where consistency score exactly matched importance score or was +1 of importance score.

multidimensional PIES shortly after discharge. Correlations were examined between FCCS sum scores, as well as the total number of importance-consistency matches for a respondent, and PIES measures assessing similar (convergent validity) or different (discriminant validity) constructs. Specifically, it was hypothesized that FCCS scores would correlate most highly with PIES measures of nursing care (item example: "How often did nurses listen carefully to what you had to say about your child's condition and your suggestions for care?") and parent involvement (item example: "How often were you included in planning and making decisions about your child's hospital care?")

and less with measures unrelated to nursing care such as physician care and the admissions process. Moreover, because the PIES assessed parents' actual experience of care, it was anticipated that FCCS consistency scores would be more correlated with PIES measures than importance scores. As shown in Table 4, all FCCS measures (importance, consistency, and number of importance-consistency matches) had their highest correlations with PIES nursing care as expected and lower correlations with non-nursing-care measures. Consistency scores and importance-consistency match scores were correlated more positively with PIES nursing care scores than importance scores alone, as hypothesized.

**TABLE 4. Convergent and Discriminant Validity: Correlations<sup>a</sup> Between Family-Centered Care Scale Measures and Other Measures of Pediatric Inpatient Care Experience**

Pediatric Inpatient Experience Survey measures	Analysis, n	Family-Centered Care Scale measures		
		Importance sum score	Consistency sum score	Number of importance-consistency matches
Nursing care <sup>b</sup>	380	0.38	0.59	0.49
Parent involvement <sup>b</sup>	337	0.27	0.50	0.42
Patient comfort <sup>b</sup>	327	0.18	0.39	0.35
Physician care <sup>c</sup>	366	0.28	0.33	0.28
Admissions process <sup>c</sup>	359	0.23	0.29	0.20
Discharge/home care preparation <sup>c</sup>	334	0.23	0.36	0.32
Medication information <sup>c</sup>	289	0.16	0.41	0.35
Hospital environment <sup>c</sup>	386	0.18	0.37	0.32

<sup>a</sup>Spearman's rho coefficients.

<sup>b</sup>Convergent validity measures.

<sup>c</sup>Discriminant validity measures.

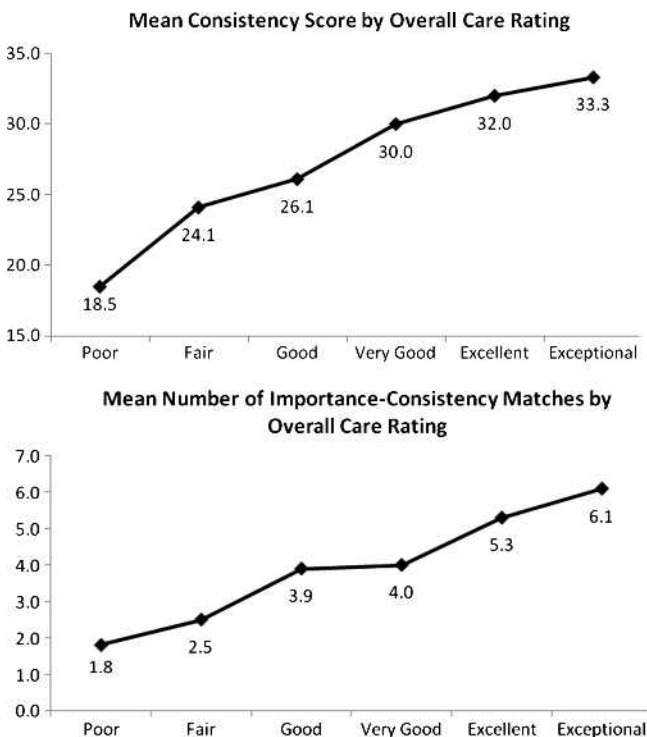
When comparing FCCS scores across parents expected to differ in their scores (i.e., parents who gave high ratings of overall care quality compared with those giving low ratings), a nearly linear association was found between FCCS consistency scores and overall quality-of-care ratings (Figure 2). Parents giving high-quality ratings (e.g., *excellent* or *exceptional*) gave significantly higher consistency scores than those who rated their child's care *fair* or *poor* (one-way ANOVA, F-statistic = 22.8 and Kruskal-Wallis chi-square = 60.4 [ $df = 5$ ],  $p < .01$  for both). Parents giving higher overall ratings also had significantly more importance-consistency matches than those with lower ratings (one-way ANOVA, F-statistic = 13.9 and Kruskal-Wallis chi-square = 51.2 [ $df = 5$ ],  $p < .01$  for both). Importance scores were not expected to differ by overall care ratings because family-centered care should be no less important to parents experiencing poor care than to those experiencing excellent care. Indeed, importance scores varied little (range = 31.5–33.7) across the quality-of-care categories.

Finally, confirmatory factor analysis of Phase 3 data suggested a slight alteration in the factor structures identified in Phase 2. In testing a two-factor model of the FCCS importance items, moving the "valued team member" item from the first factor (relating to the child's care) to the second factor (relating to how parents are treated) substantially improved the model fit (from chi-square = 58.8 [ $df = 10$ ],  $p < .001$ ), CFI =

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0.974, TLI = 0.977, RMSEA = 0.102, WRMR = 1.01 to chi-square = 15.4 [ $df = 10$ ],  $p = .12$ ], CFI = 0.997, TLI = 0.997, RMSEA = 0.034, WRMR = 0.50). In the Phase 2 EFA, this item did show a notable cross-loading on the second factor (.544), and whether nurses treat a parent as a valued team member conceptually fits in the domain of how nurses care for parents.

For the consistency items, a single-factor model was initially tested, as suggested by the Phase 2 EFA. However, some fit measures indicated inadequate fit (chi-square = 83.7 [ $df = 10$ ],  $p < .001$ ), CFI = 0.977, TLI = 0.991, RMSEA = 0.13, WRMR = 0.99), although all items had high standardized factor loadings (range = 0.86–0.92), high  $R^2$  estimates (range = 0.72–0.85), and low residual variances (range = 0.15–0.28). A two-factor model was then tested that mirrored the two importance factors, and only a minor improvement in model fit was found (chi-square = 68.3 [ $df = 9$ ],  $p < .001$ ), CFI = 0.981, TLI = 0.992, RMSEA = 0.12, WRMR = 0.88). Moreover, the intercorrelation between the two factors was extremely high (0.95), indicating little discrimination between the two factors and that a single factor is best. The chi-square and the RMSEA (which is based on the chi-square) did not meet thresholds for adequate fit; however, the power of the chi-square to detect small model-data discrepancies increases with larger sample sizes (Marsh, Balla, & McDonald, 1988) and higher inter-item correlations (Kline, 2011; inter-item  $r$  among consistency items ranged from 0.56 to 0.69), both of which characterize the sample.



**FIGURE 2.** Mean Family-Centered Care Scale consistency scores and number of importance-consistency matches by parents' rating of the overall quality of inpatient care their child received ( $n = 342$ ).

### Discussion

Analysis of the FCCS resulted in a two-factor structure, one relating to how nurses care for parents and the other on the child's care. The factor structure was supported regardless of patient type and race. Although further testing in larger groups is necessary, this important preliminary step supports the use of the FCCS across diverse inpatient groups.

The FCCS scoring links the importance and consistency ratings in a single score based on the degree of match between parents' importance and consistency ratings of each aspect of nursing care. The percent match describes the degree to which nurses provide care that is identified as important to individual parents. However, the consistency score (range = 7–35) also may be used alone, without the importance ratings, because all seven items in the final scale were rated to be the most important to parents across the multiple samples.

Over the past 50 years, dramatic shifts in the relationship between parents and pediatric nurses have occurred, with a focus on family-centered care (Jolley & Shields, 2009). Current care delivery models recognize the centrality of the family and emphasize a philosophy of care that is responsive to family needs, priorities, values, and concerns. Clinical research on the efficacy, parental perceptions, consumer satisfaction, and cost benefit of family-centered interventions is essential. Adding the FCCS to an organization's core quality metrics will provide a unique perspective on an often-overlooked, yet



fundamental, element of a common mission. Use of the FCCS, as a quality metric of family-centered care, can facilitate internal and external benchmarking.

In pediatric practice, models of nursing care delivery emphasize collaboration and reciprocal sharing of expertise between nurses and parents (Curley, 1988; Curley & Wallace, 1992). Nursing care guided by enabling strategies to equip parents with healthcare system savvy helps parents to advocate for their child. In addition, pediatric models of nursing care delivery form nurse–parent communication patterns that help establish caring relationships with a parent, assess the parent's perception of their child's illness, determine the parent's expectations, and seek suggestions and preferences while inviting participation in care. After further testing, the FCCS may be used as an outcomes measure of a model of family-centered nursing care delivery.

The primary limitation of this study was that only English-speaking samples were derived primarily from one children's hospital in the Northeast United States and that the patient population showed limited racial and ethnic variability. Also, the FCCS is a nurse-specific metric and will not capture the important contributions of the entire multidisciplinary team. Finally, this study relied solely on parent self-report and did not include observational measures of nurse–parent interactions. One could argue that parent perception is the most salient and proximal measure for gauging the family-centeredness of care delivery. However, it would be valuable to examine how well parent perception and observational measures correlate. Further psychometric testing is needed using a wider sample of hospitals and regions as well as longitudinal studies to assess the scale's sensitivity for measuring change in response to efforts to enhance family-centered care delivery.

## Conclusion

Nursing exists in the details of relationships. In pediatric nursing, these relationships include those that form between nurses and parents that are characterized by mutuality. Outcome measures that speak to these relationships will help illuminate nursing practice. The FCCS is a brief measure of parents' experiences of nursing care that embodies core principles of family-centered care and has initial evidence of reliability and validity among parents with hospitalized children. ▀

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